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## STEAMBOAT DISASTERS.

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ALTHOUGH there are many points of resemblance between the ocean-steamer and the steamers running in sounds and along shore, it will be necessary to treat of them separately. The greater number running on the Atlantic being under foreign flags, we can only hope to influence them through public opinion. Speed, economy of fuel, and luxurious accommodations are the principal elements commanding success, and, so far as we know, those carrying passengers and valuable goods are well equipped and well commanded ; the traveler seeking comfort goes on board and examines the cabins, the smoking-room, and the bath-room ; he does not inspect the life-boats or the rafts and life-saving gear, nor does he ask to see the station-bills ; the accommodations and the bill of fare are to him the most important. There is another class of steamers plying on the great thoroughfare which take few or no passengers ; they are generally long, deep, and narrow craft, some of them having double bottoms divided into spaces or tanks wherein water-ballast to the extent of several hundred tons can be carried when the vessel is light, and which, when she is heavily laden, are pumped dry. Now this is a very good arrangement for steam-colliers of considerable beam compared to their depth ; it saves time and money ; but for the class of long, deep, and narrow vessels alluded to it is open to grave objections—the tendency of such craft is to capsize ; for it is obvious that, upon the least shifting of a grain-cargo, causing the heeling of the ship, the empty space at the bottom, the air-chambers, must have a direct tendency to come to the surface, and the ship turns over : as there are not many lives at stake on these vessels, the underwriters are the parties principally interested. The greatest risk to these, as well as to the fine, fast passenger-ships, lies in the fact that most of them run out and home on the “go-as-you-please” principle ; they are not obliged, as they should be, by inter-

national compacts, to come out by one route and return by another, as is the rule by the Cunard and the Inman Companies. We never take up a paper (especially in the season of fogs and full lists of passengers) without looking for a terrible collision, involving the loss of many precious lives : the catastrophe must come sooner or later, and, until it does come, nothing will be done in regard to the establishing of what is generally known as the "ocean-lanes." In the early part of 1874 an effort was made by a committee appointed by the Social Science Association, in conjunction with the Instituté of Technology of Massachusetts, to examine into and report on the subject of "ocean-lanes" : the writer was chairman of the committee, and his associates were chosen from among prominent merchants of Boston, New York, Philadelphia, and Baltimore ; and Professor Benjamin Peirce was a member ; much correspondence ensued ; the report of the writer, dated early in January, 1875, winds up with the following words : " Your committee deem it to be of very small importance whether we adopt the Maury, Wyman, Inman, Cunard, or the Blunt tracks, as compared to adopting some well-defined courses. So long as we avoid a too near approach to the Virgin rocks, Cape Race, and Nantucket Shoals, and keep our track to the west as narrow as possible when on the fishing-grounds, it matters little which we adopt ; what we require is, a general concurrence of opinion among steam-lines." Referring to Professor Peirce's views as expressed at a meeting on the 20th of May, and alluded to in a report of the Academy of Arts and Sciences, the report goes on to say : " These views are of primary importance, and, if they can be carried out, will do more to meet the question of safety to life and property than all the figures on latitude and longitude, fog, icebergs, and collisions."

The effort failed mainly for want of a concurrence of opinion among the managers of steamship lines, and collaterally for want of the active coöperation of Professor Peirce, who, although in Europe, and much interested in the subject, could not give time to it. This matter of defined courses, out and home, stands first in importance in discussing the preventives of grave ocean disasters. Assuming that the discipline on board of the principal steamers carrying only first-class passengers and cargoes is as nearly perfect as can be expected, there is still room for improvement in the life-saving appliances ; many of the boats wrongly classed as " life-boats " are very heavy, and, in the long run, will be less useful in saving life than lighter boats would be, and they fail altogether as compared to

rafts. Besides their defects as "life-boats," they are generally so badly stowed and fitted for lowering as seldom to be found ready for the duty expected of them.

In discussing the matter of rafts, it will be well to keep in mind that wooden and metallic rafts, depending on being tight for their integrity, while less liable to injury from the attacks of vermin and fire than India-rubber rafts, may have imperfections without showing them; whereas the latter, if kept partially inflated, will at once show a leak. In cases where persons throw themselves overboard to escape fire, the wooden and the metallic rafts are more likely to injure them when they are launched than the softer rubber rafts; so that, on the whole, and disregarding the very important matter of cost, we think the rubber raft is best. Steamers should have more rafts than boats, and every movable seat on deck should be a life-preserver. Every door should be fitted to be easily unhung and made available as a raft, and after all this is done the ship herself should be as nearly unsinkable as possible; this can only be accomplished by having the engine-room, the boiler-room, and the cargo spaces absolutely shut off from each other; and the lower deck, on which the ship depends principally for the integrity of the cargo-compartments, should be of iron, and every hatch should be secured so as to be as tight as a man-hole in a boiler. Every compartment should have its own pump and its own chemical device for putting out fire. Add to these precautions careful packing of valuable goods, in water-tight casks or bales, so that each package shall be a floating power, and then stowing them intelligently, so that the lighter goods shall be put in the fine ends of the ship, and we shall have some approach to an unsinkable ship. Instead of one collision-bulk-head, generally placed rather too far from the stem, there should be two, so that, in the event of a rupture filling the forward compartment, the ship's trim shall not be materially affected. Supposing the forward compartment to be stowed full of floatable packages, every one can see that a rupture filling all the vacant spaces among the goods would not interfere materially with the trim or the safety of the ship. This matter of packing all valuable goods in perfectly tight casks or bales, while of great importance to underwriters, is also of great importance as a life-saving measure.

Next in importance are the signals and the lights. Fog-signals by whistle should denote approximately the course the ship is steering. There have been, of late, several publications on fog-signals: one has an automatic arrangement by which a signal is given for

every two points of the compass ; another still further subdivides the code, so that the most accomplished deck-officer, with nothing else to do, could not fail to make mistakes ! The safest fog-signal should denote simply whether the ship is going northerly, southerly, easterly, or westerly. As to lights, the electric light has lately been highly recommended as the best to denote the position of an approaching ship ; but grave doubts exist as to the effect upon the vision of the party showing it, so that we have some doubt as to its adoption as the principal light for a steamer. The usual screen-lights—the port one red and the starboard one green—are generally much too small. A steamer of large proportions should have light-houses large enough for a man to enter, and the light should be capable of being seen much farther than the twopenny lights in general use.

Having said thus much as to preventives in ocean-steamers, we now come to the peculiar class of steamers running in our sounds, bays, rivers, and along our coast. The late lamentable accidents by collisions and by fire have elicited many loud and some unreasonable comments ; there is much to be said both for the public and for the parties controlling the steamers ; great stress is laid upon discipline and organization, and one writer goes so far as to include the drilling of the crowd of passengers ; strict man-of-war discipline is out of the question on board of craft where the crew and firemen may walk on shore whenever they please ; but there should be frequent inspection by the representatives of the laws and by the officers of the steamers. Now, as these craft can not afford to have a full crew, well drilled, for each boat and each raft, they should have at least a competent seaman as captain to each, and he should be held responsible for the efficiency of his boat or raft ; to provide men to man all the boats and rafts at present, we must depend on the waiters and sub-officers and passengers, and all except the latter should have stations assigned to them in the event of a call to quarters. There should be at least one raft and one boat for every one hundred persons permitted to be carried, and these should be so hung and so stowed as to be accessible to the most inexperienced traveler. In harbor, or excursion-steamers running on short routes, the so-called life-preservers required by law to sustain twenty-four pounds of dead-weight should be kept in sight, handy to be got at, and they should have strings strong enough to hold the considerable strain on them when a person jumps overboard from a height. There should be posted at several

points on the steamer and in every state-room a clear illustration of the mode of attaching the life-preservers, and every chair, every seat, every door, should be a life-preserver; add to this a lot of the round life-buoys, called after the inventor the "Cartes buoy," slightly fastened to the deck-rails; and in such cases as the Narragansett and the Seawanhaka, burned near Hell Gate, there will be a fair chance of saving many that might otherwise be lost. These buoys should have life-lines several fathoms in length attached to them. It is also recommended to follow the example of the skipper on board of whose ship St. Paul was a passenger, who, according to Scripture, cast anchor out of the stern.

In the case of the Stonington, which ran into the Narragansett, her bow being stove, it is assumed that she had no means of anchoring, and so she drifted away; when, if she had been furnished with a stream-anchor near the stern, she might have been kept nearer to the scene of the disaster and have saved more persons; and so with the Narragansett, it is possible that, by anchoring immediately by one end or the other before she grounded, the fire might have been less destructive; at all events, no one can deny that a stream-anchor and hawser near the stern may sometimes be a valuable aid in saving life. The steamer New York did excellent service in the late disaster, and her officers and crew no doubt deserve credit for their prompt assistance, but they do not, we feel sure, desire to be classed as "brave and gallant heroes" for merely doing their duty. Pending the decision of the Commissioners, we say nothing as to the culpability of the sister steamers beyond the fact that at such a time and in such a place, knowing full well that they must meet near that locality, there must be great blame somewhere. After all that has been said, we must not lose sight of the fact that the traveling public is responsible for many of the sins of omission and commission so lavishly attributed to the owners, masters, and crews of the floating palaces in which one can go to New York cheaper than he can stay at home; the traveling public should examine into the safety arrangements, in preference to the furniture of the cabins, the amount of plate-glass, the gilding, and the *cuisine*.

Referring to ocean accidents, a word may be said as to the manner of rescuing persons from a ship on fire, or in a sinking condition. In the case of the steamer Connaught, lost in October, 1860, when she first sprang a-leak and then took fire, the whole crew and passengers, numbering over six hundred persons, were rescued by the brig Minnie Shiffer, Captain Wilson, who made fast to her by a hawser.

In the case of the *Central America*, Captain Herndon, in September, 1857, when four hundred and nineteen perished out of five hundred and ninety-two, there was no attempt to make fast to the wreck, and one of the rescuing vessels, the brig *Marine*, hove-to under the lee and drifted away so far that, before many could be taken off, the steamer went down. Although the sea was somewhat rough, it would have been very easy, if the proper measures had been taken, when the rescuers were seen bearing down on the steamer, to have got a hawser to her, and probably, as in the case of the *Connaught*, all might have been saved. Captain Herndon, a gallant officer of the United States Navy, went down with the ship, refusing to leave her; besides the *Marine*, a schooner ran down close to the stern of the steamer. Only three of the steamer's boats were available; by the time they had left for the second trip, the brig *Marine* had forged ahead and drifted five miles to leeward; one boat was stove alongside of her, and the others were damaged. Soon darkness set in, the bailing was discontinued, and the steamer went down.

After the ship sank at 8 P. M., many persons were left on the *débris* of the wreck until at about 1 P. M. of the *next day* the Norwegian bark *Ellen* came along and picked up forty-nine persons. The thrilling account of this remarkable case was obtained from the "United States Nautical Magazine" of January, 1858. In the case of the *Amazon*, lost by fire in the Atlantic many years since, the steam could not be shut off, the engineers having been driven from their posts, and she went careening about at full speed, swamping nearly all the boats, with the loss of many lives. The sinking of the *Birkenhead* troop-ship near the Cape of Good Hope affords a brilliant illustration of military discipline: the ship struck a rock, bilged, and sank, pending which the soldiers were called under arms, and with their colors flying went down with the ship, few surviving to tell the tale. Want of space prevents the mention of many other cases where the value of discipline became prominent. One of the most effective means for saving lives in vessels of war was recommended by Admiral Ryder, of the British Navy, consisting of a life-preserving hammock. The ordinary article with a hair mattress floated nine minutes with a six-pound shot attached to the middle, and by simply oiling the ticking it floated two hours and a half; and by filling the ticking with cork-shavings a hammock was estimated as capable of sustaining two or three persons indefinitely. The writer, after reading Admiral Ryder's account, made some ex-

periments by placing a cork mattress and hammock, blanket, etc., in a close woven cotton canvas bag which, with its mouth well secured by a string, floated *two thirty-two-pound shot four hours*, and one shot indefinitely ; a subsequent trial showed that the common hair mattress, blanket, etc., put into a waterproof bag, floated twenty-four hours with one shot of thirty-two pounds, and then a second shot was added and it floated another day. Notwithstanding the publication of these facts, the life-saving hammock has not been adopted in our navy. Many years ago a British frigate took fire near the mouth of the river La Plata, and the majority of her crew were lost for want of boats and rafts. If they had been aware of the value of their hammocks as life-preservers and had been well drilled in their use, many lives might have been saved.

Among the useful means for communicating with ships and with the shore may be mentioned a light gun, such as is in use at the stations of the United States Life-Saving Service on our coasts, by means of which a line may be sent to a ship or to the shore to save lives. Every passenger-steamer should be provided with means for throwing a line.

Referring to what has been said in regard to chemicals for extinguishing fire, several very simple devices have been thought of ; one of these consists of a reservoir of portable dimensions and moderate cost, containing liquid carbonic acid, which on being ejected extinguishes fire. This was suggested to the writer by Lieutenant-Commander F. M. Barber, United States Navy, who delivered a lecture upon it before the Massachusetts Institute of Technology in the winter of 1875-'76. It was suggested principally in reference to extinguishing fires arising from spontaneous combustion of coal in coal-laden ships. Another on a similar principle contains a chemical preparation which is ignited by breaking in the reservoir a small bottle containing a liquid. If every compartment of a cargo-ship be furnished with one of these reservoirs, so arranged that it can be operated from the deck, fire would probably be extinguished very readily.

It is taken for granted that every well-appointed steamer is so arranged that the steam can be shut off from the deck in the event of the persons in charge being driven out of the engine-room ; if not done, it should be.

Persons under the influence of panic are often induced to throw themselves into the sea, under the impression that great danger exists from being drawn down by a vortex created by the sinking



ship. Ships generally go down gradually, and it is safer to stick to the ship than to leave her, unless furnished with a good life-preserver. In regard to the use of rafts as well as all other kinds of floats, it should be kept in mind that to remain in the water, holding on by the lanyards, is much safer than crowding upon the float and so sinking or turning it over. One great safeguard to the traveling public may be found in early gymnastic exercises in the water, so that they shall constitute a part of the education of youth. Dancing is taught to both sexes as a healthy accomplishment, and it is undoubtedly good for their muscular development ; swimming will be good also for this purpose, and if taught in tanks kept at a proper temperature winter and summer, under the superintendence of experts in life-saving machines, it will not only be a graceful accomplishment, but a great blessing in times of disaster on the water.

Color-blindness is a subject we never heard of until recently ; in the "United Service Review" for August, 1880, Vol. III, No. 2, will be found some curious statistics on this imperfection by Lieutenant Schroeder, United States Navy. As affecting the signal-lights of ships, it is a subject of great importance. Quoting M. Favre, a French physician, it is reported that, in examining 1,050 men, aged from eighteen to thirty, thirty-eight were affected by peculiarity of vision. A Mr. George Wilson made experiments in Edinburgh, showing that one in seventeen persons had defective sight ; that one in fifty-five could not distinguish between red and green ; and another Frenchman found that out of five hundred and one persons, between seventeen and fifty years of age, thirteen were color-blind, and eleven others had very defective sight, and twenty-three hesitated in defining colors, showing that about nine and a half per cent. of all he examined were more or less affected. It is also stated in the article in question that color-blindness, though generally originating in birth, may be caused by bruises, by fevers, and by the excessive use of stimulants ; and a case is cited where a man mistook gold for silver, which we fancy is not a very uncommon case ! Seamen should therefore be carefully examined as to their optics, for the men on the lookout, as well as the officer on the bridge watching over some hundreds of precious lives, may by reason of color-blindness or Daltonism be worse than useless. Dr. B. Joy Jeffries, of Boston, has given much attention to this disease : he finds that, out of ninety-four employees of railroads and steamers, two are color-blind and eighteen are below the visual standard. In making any

changes in lights for vessels and signals for denoting the course in fogs, great care must be taken to have them very simple. In Lieutenant Schroeder's paper a system, said to have been introduced into the naval service of this country, and submitted to foreign governments, with the view of having it adopted as an international code, gives sound-signals for every two points of the compass, with intervals between the blasts of a certain number of seconds. This code is much too complicated. Lieutenant Schroeder simplifies it by confining the signals to northeast, southeast, southwest, and northwest, and, for intermediate points, he suggests long and short single blasts, so given as to denote the intermediate points. Omitting this subdivision, his plan is better than the other ; and we are not sure, as already suggested, that signals denoting that the course is northerly, southerly, easterly, or westerly, would not be found better in practice than any further subdivision. On the great thoroughfare, the North Atlantic, the simplest signal will be found the best. Whatever sound-signals may be adopted, it must not be forgotten that steamers running at speed under nearly full pressure may be placed in jeopardy by a sudden blowing off of steam, impairing the sound of the whistle ; or it may become necessary to blow off steam just at the time when silence may be most important, and so deaden the sound-signals and disturb verbal orders.

We would inquire, Why can not steam be blown off so as not to interfere with the sound-signals and the verbal orders ? We remember a case in point where we were present in 1849, when a Cunard steamer ran down an American bark, of whose crew and passengers about one hundred and forty were drowned and killed. The instant the steamer struck, the steam rushed out, drowning all save the cries of the frantic victims.

Let us sum up the means for preventing or at least lessening ocean disasters. We place these in the order of their importance, according to our ideas.

1. Let us come and go by some definite route or limit wherein the "lane" shall be of sufficient width to allow of the necessary deviations by reason of a want of observations or by stress of weather.

2. Let the ship be amply furnished with rafts, boats, and life-preserving machines, and let her crew be well informed as to their use.

3. Let the fog-signals be of the simplest kind ; and, last but not least, let her get over the journey as soon as possible.

This brings up the question of speed in thick weather, a much-debated subject. Now, as at certain seasons about one half the time there is fog, if we slow down to half speed the voyage is much prolonged, and the sum of the dangers is much increased. It is contended by the advocates of high speed that a powerful steamer, running on board of a vessel at half speed, would inevitably sink her, and that at a high rate the ship minds her helm quicker, and is more likely to clear an obstruction than when going at half speed. On the other hand, it is contended that a ship at full speed can not stop and go back without considerable loss of time; and the half-speed advocates say that the time in stopping and backing at half speed being less, might, in certain cases, be the means of saving lives.

After fully considering the matter of speed, we come to the conclusion that full speed is safest, save in exceptional cases, as on the Newfoundland Banks, among the fishermen, when it may be prudent to come almost to a stand. When steamers agree to cross the Banks by well-known routes, the fishermen will naturally avoid their tracks. We see no reason why steamers running on well-defined routes, such as Long Island Sound, should not go and come by different routes—say, all coming east to keep more to the south, and all going west to keep more to the north; and these routes should be clearly marked on the charts, so that sailing-vessels and steamers necessarily crossing these tracks may, in thick weather, be aware when to look sharp for the signals.

There is much said as to the speed of steamers running on such routes as Long Island Sound. We are of opinion that a regular rate of speed in thick weather is safer than half speed, and for similar reasons to those given in respect to ocean-steamers, and also for another very important reason: these steamers keep a very accurate record of the time in running from point to point, from light to light, in clear weather, and when the fog shuts in they know that at their regular speed it requires just so many minutes to run from point to point; and, since the general introduction of steam whistles and whistling-buoys, they can generally make their course good in the thickest fog. Now suppose they slow down and stop frequently to sound, it is obvious to every seaman, who knows anything of this sort of navigation, that they lose their position; of course, there are places where the boat must take unusual precautions, and perhaps stop to sound or even to anchor; but, as a general rule, the regular rate of speed and a study of the tides will be safest. In certain

kinds of steamers the deck-houses should have their roofs so contrived as to be converted into valuable rafts ; this can be easily done at small cost.

The habitual traveler by water should have his hand-bag, in which is carried the necessary baggage, so contrived as to constitute a very effective life-preserver ; a double bag of vulcanized rubber, with means for inflation by the mouth between the lining, and the outer cover may be stuffed full of clothes, and sufficient air be blown in to keep a heavy person afloat, and the contents kept dry by securely rolling up and buckling the flaps at the mouth. Now, supposing that it becomes important to save several persons, the bag must be emptied, the lining pulled out, and the whole machine inflated ; to the inner and outer parts there must be handles, or "beckets," so that persons in the water can hang on to the float. The writer has traveled many hundred miles with one of these conveniences, and, although he has never had an opportunity of saving life by it, he has found it to be a great convenience as a pillow. This contrivance is specially recommended for those who travel by excursion-steamers.

R. B. FORBES.